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Gender differences in smoking cessation: real or myth?

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Abstract

Objective **– To assess rates of smoking cessation among adult smokers in Great Britain in order to determine whether women are less likely to give up smoking than men.**

Design **– Data from three years (1988, 1990, and 1992) of the General Household Survey, a continuing cross-sectional survey of the general population living in private households in Great Britain.**

Subjects **– Adult ever-smokers of cigarettes.**

Main outcome measure **– Rate of smoking cessation, as indexed by ex-smokers as a percentage of ever-cigarette smokers, and counting those who have switched from cigarettes to pipes or cigars not as ex-smokers but as continuing smokers.**

Results **– In each year men had higher rates of smoking cessation overall than women, but this difference was accounted for by differences in the age structure of male and female ever-smoking populations. After age-adjustment, the odds of cessation in women compared with men did not differ significantly in any year (odds ratios 0.94, 0.92, and 0.98 in 1988, 1990, and 1992, respectively). Young women had higher cessation rates than young men, and middle-aged men had higher cessation rates than middle-aged women. These differences remained after adjustment for a variety of family and socio-economic variables bearing on the likelihood of cessation.**

Conclusions **– The idea that women in general give up smoking less than men is a myth, but there are real gender differences in particular age groups that need explanation. Health education should convey the message that women are equally or more effective than men at giving up smoking.**

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Introduction

For years there has been debate about the possibility that there might be gender differences in the rate of giving up smoking. Numerous reports in the media have given currency to the notion that women are less likely to quit cigarettes than are men,[1] and further support has come from reviews in leading journals.[2] At the simplest level of analysis this idea is supported by the observation that the prevalence of ex-cigarette smoking in men is considerably higher than in women (eg, 32% *vs* 21%, respectively, in Great Britain in 1992[3]). However, this analysis makes no allowance for the fact that a higher proportion of men than women have ever smoked cigarettes and hence become eligible to give them up.

Another approach to the issue has been to focus on the so-called "quit ratio" – that is, ex-cigarette smokers as a percentage of ever-regular cigarette smokers. Recent reports from the US Surgeon General have presented figures documenting the evolution of the quit ratio in men and women over the past 20 years or so.[4,5] Over the whole of this period male smokers have shown consistently higher rates of quitting cigarettes than women, with no sign of a narrowing of the gender gap. The picture is similar in the UK when the analysis is carried out in this fashion (eg, 52% *vs* 43% in Great Britain in 1992[3]). However, it has been argued that this form of the quit-ratio is itself biased against women, in that it does not incorporate any adjustment for forms of tobacco use other than cigarettes.[6,7]

It is well-known that, whereas, if women smoke in Western industrialised countries, they almost invariably smoke cigarettes, a substantial minority of male smokers use cigars or pipes. Increasingly those male cigar and pipe smokers are "secondary" smokers; that is, they have switched from smoking cigarettes, rather than "primary" smokers who have never smoked cigarettes regularly. While primary pipe and cigar smokers tend not to inhale and experience only a modest increase in risk of death compared with never-smokers, secondary pipe and cigar smokers frequently transfer their inhalation practices from cigarettes, tend to remain dependent smokers, and continue to run high risks of smoking-related diseases.[8–10] The argument is that cigarette smokers who switch to cigars or pipes should properly be regarded as continuing smokers rather than ex-smokers.

Analysis of data from the UK,[6,7] and the US,[5,6] has shown that adjusting the quit ratio for switching to cigars and pipes further attenuates the apparent gender gap in cessation rates. But in neither country does it eliminate it completely. In the US, the quit ratio in 1987, after adjusting for cigars, pipes, snuff, and chewing tobacco, was 42.1% in men and 39.9% in women,[5] while in the UK in 1988,

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adjusting for pipes and cigars, quit ratios were 41% and 38%.[11]

Perhaps in response partly to these smaller but persisting differences, recent commentators have adopted a cautious position on whether there is equality between the sexes in cessation rates.[12,13] The purpose of the present paper is to examine this issue further, using data from the British General Household Survey. The analysis focuses on cigarette cessation rates adjusted for switching to pipes or cigars, but further adjustment is then made for age, and for other social factors related to giving up smoking.

Subjects and methods

THE GENERAL HOUSEHOLD SURVEY

The General Household Survey (GHS) is a continuous cross-sectional survey, begun in 1971, and based each year on a sample of the general population in Great Britain living in private households. Questions on smoking behaviour are included every two years. The present analysis relates to the surveys for 1988, 1990, and 1992, each year having a subject base of approximately 18000 adults aged 16 and over. Full details on sample design and response rates of the GHS are given in published reports.[3,11,14]

In the GHS, current cigarette smokers are defined as those responding "yes" to the question "Do you smoke cigarettes at all nowadays?", and ex-cigarette smokers as those who respond "no" to this question but "yes" to "Have you ever smoked cigarettes regularly?" Further items enquire about current pipe ("at all nowadays") and cigar ("at least one of any kind per month nowadays") smoking.

For the analyses presented in this paper the quit ratio, or cessation rate, was adjusted for secondary pipe/cigar smoking, and was calculated as ex-cigarette smokers (less secondary pipe/cigar smokers) divided by ever-regular cigarette smokers (ex-smokers plus current smokers, including secondary pipe/cigar smokers).

Social class was determined for both men and women by own present job, or, for those not currently working, most recent job according to the classification of occupations (1980) of the Office of Population Censuses and Surveys.[15] The statistical package EGRET was used for unconditional logistic regression analysis to calculate odds ratios and 95% confidence intervals (CIs).

Results

In each of the years surveyed there was a sample of approximately 10000 ever-regular cigarette smokers (table 1), and in each year men were in a majority, reflecting their historically higher rates of smoking prevalence. Male ever-smokers were somewhat older than female, the average difference of 2.2 years in each of the three surveys being highly significant. Up to the age of about 50, reported age of starting to smoke cigarettes was similar in men and women, as was also time since giving up among those who had stopped. But among older age groups, women reported starting smoking later than men (by 2–3 years in those in their fifties, and by 4–5 years in those aged above 60), and time since stopping was on average shorter (table 2).

Table 1 Mean age (SD) of male and female ever-regular cigarette smokers, Great Britain, 1988–92

	Men		*Women*		
Year	*age*	*n*	*age*	*n*	*95% CI for difference*
1988	48·6 (17·5)	5609	46·4 (17·8)	4959	1·56–2·91
1990	48·7 (17·6)	5073	46·5 (18·2)	4543	1·43–2·86
1992	49·3 (17·8)	5187	47·1 (17·9)	4707	1·56–2·97

Table 3 shows the cessation rate (adjusted for pipes and cigars) among men and women in different age groups. Rates of cessation were strongly related to age, rising from about 15% among the youngest to over 60% in the oldest subjects. Overall, 41, 43, and 45% of male ever-smokers had quit in 1988, 1990, and 1992, respectively, compared with 38, 39, and 42% of women. There was thus a consistent difference between the sexes of some 3 percentage points. There was a trend, which was evident in all three years, towards somewhat higher cessation rates among women at younger ages, and among men in older subjects. The crude odds of cessation in women by comparison with men in the three surveys were 0.88 (95% CIs 0.82–0.96), 0.86 (0.80–0.94), and 0.91 (0.84–0.99), respectively. Thus women were significantly less likely overall to have quit. However, after age adjustment, the difference between men and women was no longer significant in any year (age-adjusted odds ratios 0.94 (0.87–1.02), 0.92 (0.85–1.01), and 0.98 (0.90–1.07) in 1988, 1990, and 1992). In a model which further adjusted for a number of other variables significantly associated with cessation, the odds ratios for women compared with men were 0.94 (0.85–1.05), 1.00 (0.89–1.11), and 1.07 (0.96–1.19), respectively. The additional variables in this model were social class, housing tenure, car ownership, marital status and spouse's smoking status, lone parenthood, working status, pregnancy, number of dependent children, and region of residence.

In view of the evidence that gender differences in rates of giving up smoking varied as a function of age, the sample of ever-smokers was broken down into narrower age bands to examine these patterns in greater detail. In addition to examining each year of the GHS separately, a combined data set was created by summing data from all three surveys, the purpose being to obtain more stable estimates in each age group by increasing the number of observations. The results are shown in table 4. Both the crude odds and odds adjusted for the same set of social variables as above were calculated. The pattern with both crude and adjusted odds was broadly similar in each year considered separately, but is seen most clearly in the analysis of the combined data. Women showed consistently higher rates of cessation

Table 2 Smoking history by age in men and women: General Household Survey 1988, 1990, and 1992 combined

Age group	Age at starting to smoke cigarettes			Ex-smokers quitting more than 10 years ago (%)		
	Men	Women	95% CI for difference	Men	Women	p-value*
16–19	14.8	14.7	−0.16, 0.30	0	0	NS
20–24	15.7	15.9	−0.41, 0.08	0	1	NS
25–29	16.1	16.4	−0.51, −0.05	10	9	NS
30–34	16.4	16.8	−0.73, −0.22	29	28	NS
35–49	16.4	18.0	−1.74, −1.38	57	56	NS
50–59	17.0	19.6	−3.0, −2.3	65	55	< 0.001
60+	17.2	21.9	−4.9, −4.3	74	66	< 0.0001
All ages	16.6	18.7	−2.2, −2.0	61	52	< 0.0001
n, all ages	15702	13970		7943	5597	

* p-value from a χ^2-test comparing overall distribution of time since quitting in male and female ex-smokers.

Table 3 Adjusted smoking cessation rates (%) by age and sex: General Household Survey 1988–92

Age group	1988		1990		1992	
	Men	Women	Men	Women	Men	Women
16–19	11	14	12	16	14	16
20–24	18	18	14	17	16	20
25–29	21	29	22	26	23	29
30–34	28	34	28	32	33	32
35–49	37	37	39	37	39	42
50–59	45	35	50	41	48	42
60+	58	53	60	58	64	60
All ages	41	38	43	39	45	42
n						
16–19	177	212	163	218	155	154
20–24	367	397	299	365	325	356
25–29	399	447	425	433	398	483
30–34	439	458	395	380	393	414
35–49	1593	1380	1397	1244	1388	1291
50–59	903	696	807	628	862	693
60+	1731	1369	1587	1275	1666	1316
All ages	5609	4959	5073	4543	5187	4707

Table 4 Crude and adjusted odds ratios (±95% CI) of smoking cessation by age in women relative to men: General Household Survey 1988, 1990, and 1992 considered separately and combined

Age group	Crude odds				Adjusted odds*				Combined base (*n*)
	1988	1990	1992	Combined	1988	1990	1992	Combined	
16–25	1.00 (0.75–1.34)	1.26 (0.92–1.72)	1.23 (0.90–1.66)	1.15 (0.96–1.37)	0.88 (0.60–1.28)	1.25 (0.83–1.87)	1.16 (0.80–1.70)	1.08 (0.87–1.35)	3704
26–35	1.30 (1.06–1.60)	1.32 (1.07–1.64)	1.19 (0.97–1.47)	1.27 (1.13–1.44)	1.20 (0.90–1.59)	1.23 (0.91–1.66)	1.30 (0.98–1.73)	1.26 (1.07–1.49)	5073
36–42	1.09 (0.88–1.35)	1.09 (0.86–1.38)	1.35 (1.07–1.71)	1.17 (1.02–1.33)	1.07 (0.78–1.46)	1.30 (0.94–1.79)	1.83 (1.31–2.54)	1.33 (1.11–1.59)	3805
43–50	0.99 (0.80–1.23)	0.74 (0.60–0.92)	0.94 (0.77–1.15)	0.89 (0.79–1.00)	1.07 (0.80–1.43)	0.72 (0.54–0.95)	1.20 (0.91–1.58)	0.99 (0.84–1.17)	4452
51–57	0.64 (0.50–0.81)	0.65 (0.50–0.83)	0.77 (0.61–0.98)	0.69 (0.60–0.79)	0.54 (0.38–0.77)	0.69 (0.48–0.98)	0.61 (0.43–0.85)	0.63 (0.52–0.76)	3210
58–64	0.82 (0.66–1.03)	0.77 (0.60–0.98)	0.81 (0.63–1.03)	0.80 (0.70–0.92)	0.79 (0.56–1.10)	0.73 (0.51–1.05)	0.92 (0.64–1.32)	0.82 (0.68–1.01)	3316
65–70	0.73 (0.56–0.94)	0.90 (0.70–1.16)	0.93 (0.74–1.18)	0.80 (0.69–0.93)	0.88 (0.61–1.26)	1.04 (0.74–1.46)	0.76 (0.53–1.08)	0.90 (0.74–1.10)	2865
71+	0.91 (0.72–1.15)	0.95 (0.74–1.22)	0.93 (0.74–1.18)	0.93 (0.81–1.07)	1.21 (0.87–1.67)	1.12 (0.78–1.60)	1.13 (0.83–1.55)	1.17 (0.97–1.41)	3653
All ages	0.88 (0.82–0.96)	0.86 (0.80–0.94)	0.91 (0.84–0.99)	0.89 (0.85–0.93)	0.94 (0.85–1.05)	1.00 (0.89–1.11)	1.07 (0.96–1.19)	1.00 (0.94–1.07)	30078

* Adjusting for: age, class, housing tenure, car ownership, marital status and spouse smoking, lone parenthood, working status, pregnancy, number of dependent children, and region of residence.

up to the early forties, while men were significantly more likely to have quit in middle age. Among the oldest subjects, there were no reliable gender differences.

Discussion

The results of the present analysis point clearly to the conclusion that the supposed overall gender difference in rate of quitting smoking is more myth than reality. The small differences in cessation rates between men and women which remain after adjustment for secondary cigar and pipe smoking were explained by differences in the age structure of male and female ever-smoking populations. Male ever-smokers were, on average, some 2–3 years older than females, and given the strong age-dependency of giving up smoking, this in itself was sufficient to account for the observed difference in cessation rates. Additional adjustment for a variety of family and socio-economic variables bearing on the likelihood of quitting smoking had only a small further effect on overall gender differences. These findings were replicated in three consecutive sets of data on smoking from the British GHS, and would therefore appear to be robust, as well as applicable to the general population of smokers in Great Britain.

The principal potential objection to the validity of the present findings arises from a challenge to the assumption underlying the analysis – ie, that the appropriate cessation rate to consider is that which adjusts for switching to pipes and cigars, rather than the simple cigarette quit ratio. Historically, a number of large smoking intervention trials defined giving up smoking as giving up cigarettes, and did not count switching to pipes or cigars as vitiating claims of cessation.[16,17] But evidence on smoke intake from the same trials demon-

strates the limitations of this approach, and few if any would follow it now. For example, men in the Multiple Risk Factor Intervention Trial who stopped smoking cigarettes and switched to cigars or pipes had very similar levels of smoke intake after switching as they had previously from cigarettes.[18] The argument as it relates to cessation rates in the population is essentially the same as that applied to trials of smoking intervention in individual subjects. Should someone who continues to inhale substantial quantities of tobacco smoke and remains nicotine dependent be considered an ex-smoking success or a continuing smoker?

Despite the absence of overall gender differences in rates of smoking cessation, there were consistent differences within particular age groups. Up to the age of about 40, there was a significantly higher rate of cessation among women than men. This was followed by a period of some 15 to 20 years, from about age 50 to 65, where men display higher cessation rates than women. Finally, in the oldest age groups, there is equality between the sexes.

A variety of explanations could be offered for this pattern. One suggestion might be that the present analysis did not go far enough, and should also have adjusted for primary pipe and cigar smoking, which is also largely a male phenomenon, and found particularly in older age groups. On this view, a general excess of female over male cessation rates at all ages might emerge, reflecting women's generally higher compliance with norms of socially desirable behaviour. However, in an analysis which adjusted for primary pipe/cigar smoking, the male advantage in middle age remained (data not presented).

A second set of explanations might refer to men's and women's different experiences of significant life events and social circumstances at different ages. In particular, pregnancy and childbearing give women additional reasons for giving up smoking over men at a relatively young age, while men's higher rates of smoking-related disease and death in their fifties could sharpen their awareness of health risks and the need for healthy changes in lifestyle. One analysis of gender differences in smoking in older people in the US has invoked male/female differences in socio-economic circumstances.[19]

To the extent that having children acts as an important stimulus to cessation, and one that has a differential impact on men and women, adjustment of the odds of cessation for pregnancy and for the number of dependent children should erode the observed gender difference among younger adults. But this was not found, and adjustment for deprivation, marital status and spouse's smoking, and whether the person was economically active or inactive, also did not substantially alter the observed association. Similarly, the male advantage in middle age was essentially unchanged by adjustment for measured family and socio-economic variables associated with cessation.

Thus accounts of age-dependent gender differences couched in terms of women's and men's differing life experiences must at present remain largely speculative. To the extent that analyses in the present paper have addressed these issues, little support has emerged for this class of explanation.

One set of male-female differences which might have some bearing on smoking cessation did emerge from the data. Men and women had somewhat different smoking histories, but this was largely confined to those aged 50 and above. Up to age 50, men and women reported having started smoking at similar ages, and, among those who had given up, the time since quitting was also similar. But among older people, women had started smoking later in life than their male counterparts, and the size of this effect grew larger with increasing age. There were thus cohort effects evident which could well influence motivation to quit. Given that the personal experience of smoking-related disease is an important influence on decisions to give up smoking, and that risk of disease is strongly related to duration of smoking, it could be that older women with shorter smoking careers were less motivated to give up because of health concerns. In line with this is the observation that older ex-smoking women had in general given up more recently than their male counterparts. If this analysis is correct, it suggests that where men and women are matched for smoking history, women are more likely to give up smoking than are men. To the extent that there is a real generational shift as between older and younger women in the direction of an increased likelihood of early cessation by comparison with men, the implications for future trends in smoking cessation in women are encouraging.

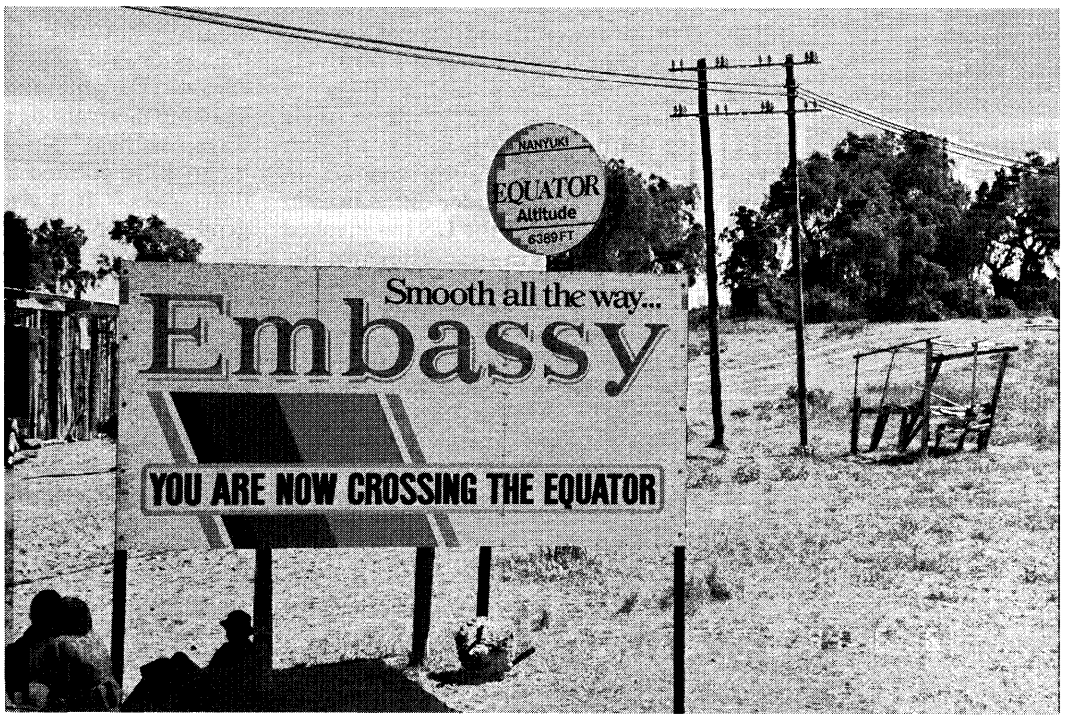
Certain limitations on the present findings should be noted. The overall lack of gender differences in rate of smoking cessation does not necessarily imply either that men and women smoke for the same reasons, or that their pathways to giving up are the same. It is entirely possible that men's and women's smoking motivations might differ in important ways, as has been suggested,[20–22] although others have pointed to a lack of gender-based differences.[23] It is also possible that there are gender differences in the number of quit attempts necessary to achieve permanent cessation. These are not matters which can be addressed from the present data. However, adjustment of the odds of cessation in men and women for variables which have a major bearing on rates of quitting smoking did not alter estimates greatly, either overall, or in the age-specific patterns observed. These variables included the influence of spouse's smoking, of social and material deprivation, of work status, and of pregnancy and having children. The impact of these variables on cessation, with the obvious exception of pregnancy, tended to be similar in men and women (MJ Jarvis, unpublished data). This suggests that it may not be a simple matter to find explanations of the varying age-related patterns of gender differences in smoking cessation. Important variables not available in the present data include

those concerning levels of dependence on tobacco and individual health status.

The findings of the present analysis indicate that there are real differences in smoking cessation between men and women, but that these are confined to particular age groups and, with the balance of advantage shifting between the sexes at different ages, the overall net result is approximate equality. This challenges the widely accepted belief that women in general are lagging behind men in smoking cessation, and suggests a more complex research agenda which attempts to explain why young women are more likely to quit than young men, and middle-aged women less likely than middle-aged men. It may now be time to abandon the crude idea that women in general are less likely than men to give up smoking. As well as not being supported by the data, this notion risks portraying women as victims, and might itself be thought likely to undermine their sense of self-efficacy. It may turn out that by focusing on relatively small differences between the sexes, we may tend to neglect the major factors affecting smoking cessation which operate in men and women in the same way.

Material from the General Household Survey made available through the Office of Population Censuses and Surveys and the ESRC Data Archive has been used with permission of the Controller of HM Stationery Office. I thank Eileen Goddard for her assistance in providing data and for helpful discussions.

1 The smouldering sex: why women won't stop smoking. *New Statesman*, 14 June 1985; Why can't women give up smoking? *Daily Mail*, 17 June 1985; Women are still ignoring the smoke signals. *Daily Mail*, 23 December 1993; Fewer women give up smoking than men. *The Independent*, 9 March 1994.
2 Bartecchi CE, MacKenzie TD, Schrier RW. The human costs of tobacco use. *N Engl J Med* 1994; **330**: 907–12.
3 Thomas M, Goddard E, Hickman M, Hunter P. *General household survey 1992*. London: HMSO, 1994.
4 US Department of Health and Human Services. *The health consequences of smoking: nicotine addiction: a report of the Surgeon General*. Washington DC: US Government Printing Office, 1988. (DHSS Publication No (CDC) 88–8406.)
5 US Department of Health and Human Services. *The health benefits of smoking cessation: a report of the Surgeon General*. Washington DC: US Government Printing Office, 1990. (DHSS Publication No (CDC) 90–8416.)
6 Jarvis MJ. Gender and smoking: do women really find it harder to give up? *Br J Addict* 1984; **79**: 383–7.
7 Jarvis MJ, Jackson P. Cigar and pipe smoking in Britain: implications for smoking prevalence and cessation. *Br J Addict* 1988; **83**: 323–30.
8 Ockene JK, Pechacek TF, Vogt T, Svendsen K. Does switching from cigarettes to pipes or cigars reduce tobacco smoke exposure? *Am J Public Health* 1987; 77: 1412–6.
9 Kaufman DW, Palmer JR, Rosenberg L, Shapiro S. Cigar and pipe smoking and myocardial infarction in young men. *BMJ* 1987; **294**: 1315–7.
10 Tang JL, Cook DG, Shaper AG. Giving up smoking: how rapidly does the excess risk of ischaemic heart disease disappear? *J Smoking Related Dis* 1992; **3**: 203–15.
11 Foster K, Wilmot A, Dobbs J. *General household survey 1988*. London: HMSO, 1990.
12 Graham H. *When life's a drag: women, smoking and disadvantage*. London: HMSO, 1993.
13 Ockene JK. Smoking among women across the life span: prevalence, interventions, and implications for cessation research. *Ann Behav Med* 1993; **15**: 135–48
14 Smyth M, Browne F. *General household survey 1990*. London; HMSO, 1992.
15 Office of Population Censuses and Surveys. *Classification of Occupations*. London: Government Statistical Service, 1980.
16 Hughes GH, Hymowitz N, Ockene JK, Simon N, Vogt TM. The Multiple Risk Factor Intervention Trial (MRFIT) v Intervention on smoking. *Prev Med* 1981; **10**: 476–500.
17 Rose G, Hamilton PJS. A randomized controlled trial of the effect on middle-aged men of advice to stop smoking. *J Epidemiol Comm Hlth* 1978; **32**: 275–281.
18 Jarvis MJ, West R, Tunstall-Pedoe H, Vesey C. An evaluation of the intervention against smoking in the Multiple Risk Factor Intervention Trial. *Prev Med* 1984 **13**: 501–509.
19 King AC, Taylor CB, Haskell WL. Smking in older women: Is being female a risk factor for comtinued cigarette use? *Arch Intern Med* 1990; **150**: 1841–1846.
20 Waldron I. Patterns and causes of gender differences in smoking. *Soc Sci Med* 1991; **32**: 989–1005.
21 Solomon LJ, Flynn BS. Women who smoke. In: CT Orleans, J Slade eds. *Nicotine addiction: principles and management*. New York: Oxford University Press, 1993; 339–349.
22 Batten L. Respecting sameness and difference: taking account of gender in research on smoking. *Tobacco Control* 1993; **2**: 185–186.
23 Clarke V, White V, Beckwith J, Borland R, Hill D. Are attitudes towards smoking different for males and females? *Tobacco Control* 1993; **2**: 201–208.



When traveling in Kenya and passing the equator at Nanyuki, one is greeted by both an old, dull sign and a larger, more colourful sign. Submitted by Orjan Akerberg (Sweden).